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SHELF FOR SUPPORTING ITEMS, PARTICULARLY IN
REFRIGERATED INSTALLATIONS

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Ins B2

5 The present invention relates to a shelf (or rack) for supporting items and which is intended to be secured or mounted, in a horizontal position, in the chassis of an item of furniture. In particular, it relates to a shelf particularly suited to use in chiller cabinets or refrigerators for supporting foodstuffs in particular.

10 In domestic refrigerators, it is known practice to employ racks in the form of solid sheets of plastic or glass, such sheets being simple to clean, hygienic and capable of supporting all kinds of foodstuffs effectively. It is also known practice for these sheets to be fitted with a surround which makes it possible to eliminate the risk of injury on the edges of the sheets and/or to strengthen the said sheets. In the case of a plastic surround, this surround is generally produced by positioning the sheet in a mould and injecting plastic around the periphery of the sheet to form a peripheral strip. It is also known practice for the front edge of the sheet and part of the adjacent lateral edges to be surrounded with a plastic profile of appropriate size and possibly for the rear edge and part of the adjacent lateral edges to be surrounded with another plastic profile of appropriate size. In any event, a change in panel size entails readjusting the dimensions of the surround and therefore changing the mould and/or the profiles, these adaptation operations leading to additional costs.

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The object of the present invention is to provide a new shelf which is hygienic, practical and reliable for supporting items, particularly in refrigerated items of furniture, and which is simpler and more economical to produce than the aforementioned shelves, and which can, in particular, be manufactured to different sizes without leading to significant costs associated with the changes in size.

This objective is achieved by virtue of the shelf according to the invention which comprises at least one support panel formed of at least one sheet of glass, or possibly plastic, the shelf further
5 comprising at least one cornerpiece, preferably made of plastic, this cornerpiece covering just one corner of the panel.

The panel (or "support panel") of the shelf according to the invention is generally in the form of
10 a sheet or alternatively an element which has an approximately flat surface and is not very thick by comparison with its area; it comprises an upper face (in the functional position), which is generally approximately flat, intended to take the items that are
15 to be supported, and comprises an underside and at least two adjacent lateral sides bordering or delimiting the said upper face and underside, and forming at least one corner or "angle". In what follows, the term "corner" or "angle" of the panel is
20 obviously intended to denote a corner formed by lateral sides of the panel, that is to say a corner in the plane of the panel (that is to say in a horizontal plane when the panel is put into its functional position).

The panel comprises at least one corner and generally has several corners. In many instances, it has four corners; it is generally of approximately rectangular shape (when considering, for example, its upper face or its horizontal section in its position of
30 use) but may possibly have some other shape, for example a square shape or even some other polygonal shape.

The panel is formed of at least one sheet of glass or possibly plastic (preferably transparent for
35 aesthetic and practical reasons). In most cases, the panel is formed of just one sheet, generally a few millimetres thick, but it is also possible in certain instances to envisage more complex structures, particularly laminates made up, for example, of a

number of sheets of glass and/or plastic and possibly comprising one or more sheet(s) of other material(s). When the panel has a complex, particularly laminated, structure, it preferably has at least one sheet of
5 glass or plastic on the upper face (particularly for hygiene and upkeep reasons) for taking the items that are to be supported. The panel preferably comprises one or more sheets of glass, the use of this material, in the context of the invention, offering advantages in
10 terms of hygiene, rigidity, life, etc. For safety reasons, this glass is preferably tempered, especially when the panel consists of a single sheet of glass.

The surface of the panel is generally solid, but it is possible to envisage the use of a panel with
15 one or more perforated areas. It is also possible to envisage the use of a panel with one or more grooves or one or more recesses or possibly one or more reliefs, for example, as described later, a panel with one or more grooves for anchoring or attaching auxiliary
20 pieces, particularly for anchoring cover pieces. The panel may have decorative or functional layers or patterns, at the surface or interleaved, particularly decorative patterns produced in an ink that has to be fired deposited, for example, by screen printing and
25 then baked. The panel is preferably transparent, in full or in part, for aesthetical and practical reasons.

According to the invention, the shelf comprises at least one cornerpiece (or corner protector or corner cover or alternatively corner protection piece or
30 corner cover piece), preferably made of plastic, this cornerpiece covering just one corner or angle of the panel. The cornerpiece according to the invention is an elbowed or angular piece tailored to the angle of the panel that it is to cover. It has two lateral parts or
35 legs (which meet forming the elbow or the corner) capable of at least partially covering each of the two adjacent sides of the panel that form the corner that is to be covered. This corner protector may cover the corner and the said sides over part or all of their

height and/or over part of the adjacent edges of the underside and/or of the top face, it being possible for coverage to differ according to the location (the protector may, for example, have decorative openings allowing a glimpse of the edge face of the panel at certain points). As a preference, the cornerpiece covers the corner and the aforementioned sides over at least part of their height (and preferably over the entire height at least at the protruding edge where the two sides that form the corner intersect) and over part of the adjacent edges of the underside and of the top face.

The length of each leg of the cornerpiece is generally chosen to be less than or equal to, and preferably less than, the length of the side that it covers. As a preference, for one range of products, such as, for example, refrigerator shelves, for which the dimensions vary by a few centimetres depending on the make and format, use is preferably made, regardless of the shelf produced for the aforementioned range, of a cornerpiece, each leg of which has a length shorter than or equal to the shortest standard length, in the aforementioned range, of the side that it is to cover.

The support panel generally has a number of corners. According to the invention, it is fitted with at least one cornerpiece as defined hereinabove at least at one of these corners and most often comprises several cornerpieces, each cornerpiece advantageously covering just one corner of the support panel. As a preference, the shelf has as many cornerpieces of the type described hereinabove (it being possible, however, for the pieces to exhibit differences with respect to one another, as illustrated later) as the panel has corners, each corner of the panel being covered by one cornerpiece. Thus, in the most frequent scenario in which the panel is of rectangular shape, it is preferably fitted with four cornerpieces, each one covering one corner of the panel.

The panel that forms the shelf according to the invention therefore has a covering in the form of at least one cornerpiece and, in general and as a preference, in the form of at least several
5 cornerpieces as defined hereinabove, these pieces being detachable from one another and being detachable from any other cover elements there may be. As a preference, the panel is surrounded by a cover around its entire periphery, this covering advantageously being formed of
10 a number of separate cover pieces (comprising the cornerpiece or pieces defined hereinabove) which have been assembled, each cover piece preferably fully or partially covering just one lateral side or two adjacent lateral sides of the panel. In particular, it
15 is possible to use cover pieces such as straight pieces to cover those parts of the lateral sides of the panel which are not covered by the cornerpieces; however, as a preference, for economical and practical reasons in particular, the panel is fitted, by way of periphery
20 cover pieces, only with the cornerpieces defined hereinabove, these pieces preferably having a length and shape such that they alone cover the entire periphery of the panel.

It can be seen that the shelf according to the
25 invention is particularly advantageous, particularly in terms of production, because it comprises at least one cover piece in the form of a cornerpiece which can alone protect a sharp edge (at a corner of the panel) and at least part of two adjacent sides of the panel,
30 and can do so regardless of the dimensions of the panel. Specifically, this cornerpiece can fit a chosen corner of the panel when the panel dimensions are changed, without changing its shape or geometric configuration or possibly its thickness, this
35 adaptability being economically advantageous. It is thus possible to produce various shelves of various sizes according to the invention, having at least one covering on their most "sensitive" parts, without the need to adapt the cover pieces used.

As a preference, at least two cover pieces and advantageously all of the pieces that cover the lateral sides of the shelf according to the invention are able to fit together. In particular, according to one
5 advantageous embodiment of the invention, at least one and preferably each cornerpiece can fit together with the adjacent pieces that cover the lateral sides of the panel. As a preference, the panel is fitted only, by way of cover pieces, with the cornerpieces defined
10 hereinabove, these pieces preferably having a length and shape such that they fit together and alone cover the entire periphery of the panel.

As a particular preference, at least two cover pieces and advantageously all of the pieces that cover
15 the lateral sides of the panel are able to fit together over part, preferably a large proportion, of their length and to slip or slide one inside the other so as to form a telescopic set of cover pieces. In particular, in one advantageous and preferred
20 embodiment of the invention, at least one cornerpiece, preferably at least two cornerpieces and more preferably still, each cornerpiece is (are) able to fit, at each of its (their) legs, onto a part, preferably a large proportion, of the length of the
25 leg, and to slip or slide in the adjacent cover pieces so as to form a telescopic set of cover pieces. The expression "a large proportion of the length" is to be understood as meaning a proportion which may represent up to about 99% of the said length, for example a
30 proportion of between about 40 and 96% of the length. In the sphere of refrigerator shelves, this "large proportion of the length" represents a number of centimetres, for example. Furthermore, when it is said that one cover piece or at least part of one cover
35 piece (for example a leg) can fit over a large proportion of its length, this obviously means that this piece can be fitted over a greater or lesser proportion of its length as the case may be, maximum

fitting-together occurring over a large proportion of its length.

The cover pieces preferably each have either one male end and one female end, or two male ends, or two female ends, the female end of one piece being capable of taking the male end of an adjacent cover piece, the male ends and the female ends being alternated. As a preference, as mentioned earlier, the lengths and shapes of the male and female ends are chosen so that the male end can be introduced into and slip or slide in the female end over a length of the order, for example, of several centimetres. This then yields a telescopic cover structure which can be fitted to panels of different sizes without the need to manufacture cover pieces of different lengths when the dimensions of the panel change. In other words, the same set of cover pieces (particularly cornerpieces) can be used to cover, over the entirety of their periphery, various panels which have the same shape and possibly the same thickness but which have different dimensions.

As a preference, the panel is fitted only, by way of periphery cover pieces, with cornerpieces such as those defined according to the invention, these pieces having a length and shape such that they fit together and can slip or slide (or enter) one in the other over part, preferably a large proportion, of the length of their respective legs, so as to form a telescopic structure capable of covering the entire periphery of the panel, for different sizes of panel. In particular, when using a moulded cornerpiece which has a male end and a female end capable, telescopically, of taking the male end of a second, identical, cornerpiece, it is possible, for covering the periphery of a rectangular panel, to use four identical cornerpieces, this embodiment having the advantage of requiring just one single mould to produce all of the cover pieces and to do so for varying panel dimensions.

The cornerpieces are preferably moulded. Any other cover pieces there might be may also be moulded or may, for example, be extruded. The cover pieces (including the cornerpieces) generally have an approximately U-shaped central cavity and may be equipped with one or more reliefs (or projections or pegs or ribs) on the inside for, for example, stiffening these pieces and/or positioning these pieces correctly relative to the panel, etc. As a preference, these pieces are attached to the panel, for example via one or more bonding or anchoring means, preferably via one or more internal reliefs allowing these pieces to be "clipped" (or anchored) into one or more grooves made on one and/or the other surface of the panel. The shelf may therefore be produced, for example, by forcibly fitting each of the cornerpieces onto one corner of the panel one after another (and by slipping and/or force-fitting any other cover pieces between the cornerpieces) until the reliefs enter the groove or grooves in the panel.

Depending on the embodiment, one or more cover pieces, particularly cornerpieces, may be customized and/or may comprise one or more additional functional and/or decorative parts or elements. In particular, one or more cover pieces (particularly cornerpieces) may comprise or be capable of taking, via appropriate fixing means, one or more means for assembling (or securing or attaching) to the chassis of an item of furniture in which the shelf is intended to be mounted and/or may comprise (or be capable of taking) one or more fins on the underside (or "flanges") in particular comprising one or more metal parts preferably embedded in a plastic, for stiffening the rack and giving it better stability when the shelf is attached to the chassis only along one edge ("self-supporting" rack). It is also possible to provide, on one or more cover pieces, one or more rims and possibly one or more seals between the rims and the panel so as to prevent liquids from running off the shelf and/or one or more strips

(or backrests) acting as buffers to prevent, for example, the products placed on the shelf from coming into contact with the wall of a refrigerated piece of furniture containing them. It is also possible to provide one or more grips on one side of the shelf intended to remain free, and the shelf may be capable of being fitted between runners by two opposing lateral sides, possibly via assembly means such as stubs or projections, inside the item of furniture intended to contain it. It is also possible to provide, on the cover pieces, one or more means for attaching additional functional and/or decorative element(s). In the preferred case according to the invention, in which the cover pieces, particularly the cornerpieces, fit together, it is possible to chose cover pieces which fit together over their entire height, even when the pieces have a complex cross section due to the presence of elements such as fins or buffer strips on these pieces, or it is possible to choose cover pieces which fit together over only part of their height, the remaining part being tailored by cutting, according to the size of the panel to be covered, as illustrated later in Figures 3 and 4 in particular.

In general, the shelf according to the invention may be produced by assembling one or more cornerpieces at the periphery of a support panel, each cornerpiece covering just one corner of the panel. The cornerpiece- or pieces and, as appropriate, the additional cover pieces may be slipped along the periphery of the panel and/or forcibly inserted until they anchor in one or more recesses or grooves in the glass; the cover pieces, particularly the cornerpieces, can also be fitted together one in the other over at least part of their length and of their height, the remaining part of their height possibly being adjusted by cutting.

Other advantages and features of the invention will become apparent in the light of the following

drawings which illustrate the invention without, however, limiting it, and in which:

5 ◦ Figure 1a depicts a diagrammatic view from above of a cornerpiece used in a first embodiment of the invention;

 ◦ Figure 1b depicts a diagrammatic front-on view of the cornerpiece depicted in Figure 1a, in section on the line A-A of Figure 1a;

10 ◦ Figure 1c depicts a diagrammatic side view of the cornerpiece depicted in Figure 1a, in section on the line B-B of Figure 1a;

15 ◦ Figure 1d depicts a diagrammatic view from above (in the functional position) of a shelf according to a first embodiment of the invention, using the cornerpiece depicted in Figure 1a;

 ◦ Figure 1e depicts a diagrammatic view from above of a shelf of smaller dimensions than the shelf depicted in Figure 1d, but which uses the same cover pieces;

20 ◦ Figure 2a depicts a diagrammatic view from above of a cornerpiece used in a second embodiment of the invention;

25 ◦ Figure 2b depicts a diagrammatic view from above of another cornerpiece used in a second embodiment of the invention;

 ◦ Figure 2c depicts a diagrammatic view from above of a shelf according to a second embodiment of the invention, using the cornerpieces depicted in Figures 2a and 2b;

30 ◦ Figure 3a depicts a diagrammatic view from above of a shelf according to a third embodiment of the invention, part of a cornerpiece having been removed so as to reveal reinforcing elements;

35 ◦ Figure 3b depicts a diagrammatic view in exploded perspective of the shelf depicted in Figure 3a;

 ◦ Figure 4a depicts a diagrammatic half view from above of a shelf according to a fourth embodiment

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of the invention, the shelf being symmetric with respect to the line depicted in chain line;

o Figure 4b depicts a diagrammatic side view of the shelf depicted in Figure 4a.

For reasons of simplicity and clarity, elements which are similar (even if they differ slightly from one embodiment to another) carry the same references from one figure to the next.

In all the embodiments of the invention illustrated in Figures 1d, 1e, 2c, 3a, 3b, 4a and 4b, the shelf 1 comprises a panel consisting of a sheet of tempered glass 2 and comprises four moulded plastic cornerpieces 4, 5, 6, 7, each covering one corner of the panel and part of the two adjacent sides forming the corner; for example, as evident in Figure 3b, the pieces 4, 5, 6, 7 cover the corners 8, 9, 10, 11 and part of the adjacent sides that form these corners, respectively, the sides being referenced 12, 13, 14 and 15, and the piece 4 for example covering part of the sides 12 and 13.

Each cornerpiece comprises two legs each having one end (4a and 4b, 5a and 5b, 6a and 6b, 7a and 7b, respectively) and the cornerpieces 4, 5, 6, 7 can fit together and slide one in the other over a substantial proportion of the length of each leg. In these embodiments, it is thus possible, by fitting the cornerpieces together to a greater or lesser extent, to use the same cover pieces to cover panels of different sizes (see, in particular, Figure 1d and Figure 1e) on their periphery, the shelves produced according to these embodiments being particularly economical.

Shelves can be manufactured quickly and easily by slipping each cornerpiece onto the edge of the panel one after another in such a way that they fit together one in the other and then by forcibly inserting the cornerpieces into one or more grooves 16 (visible in Figure 3b) made on the upper face of the glass panel a few millimetres away from the edge until these pieces are anchored in the said groove or grooves. For this

purpose, the cornerpieces are equipped with internal projections 17 (visible in Figures 1b and 1c) that allow the cornerpieces to be anchored and held in the groove or grooves in the glass.

5 In the first embodiment illustrated in Figures 1d and 1e, the shelf comprises four moulded cornerpieces 4, 5, 6, 7, the structure of which is illustrated in Figures 1a, 1b and 1c representing the piece 4 (the other cornerpieces being identical in this
10 embodiment). Each cornerpiece comprises two legs, one leg having a male end (the ends 4a, 5a, 6a, 7a, respectively), and the other having a female end (4b, 5b, 6b, 7b, respectively) which can, telescopically, take the male end of an identical cornerpiece. It is
15 thus possible to use just one design of cover piece to cover panels of different sizes (Figure 1d and Figure 1e) on their periphery, the shelves produced according to this embodiment being particularly economical.

20 In the embodiment illustrated in Figures 1d and 1e, it can also be seen that the panel is decorated on its top face with parallel lines 3 produced, for example, using an ink which is screen-printed then baked.

25 In the embodiment depicted in Figure 2c, the shelf comprises four moulded cornerpieces, identical in pairs, each covering a corner of the panel and part of the two adjacent sides that form the corner. The cornerpieces 5 and 7 (the structure of which is
30 illustrated in Figure 2b) each comprise two legs each having a male end (5a and 5b, 7a and 7b, respectively, the last-mentioned reference not being visible in Figure 2c, the part 7b being concealed by the part 4a into which it is fitted), while the cornerpieces 4 and
35 6 (Figure 2a) each comprise two legs each having a female end (4a and 4b, 6a and 6b, respectively) capable of taking a male end of one of the cornerpieces 5 and 7. The alternating cornerpieces can thus be fitted together and slide one in the other and are thus

adaptable to suit panels of different sizes to form shelves of different sizes, minimizing the adaptation needed.

5 In the third embodiment illustrated in Figures 3a and 3b, each cornerpiece comprises a leg which has one male end (4a, 5a, 6a, 7a, respectively) and a leg which has a female end (4b, 5b, 6b, 7b, respectively) capable, over part of its length, of taking the male end of an adjacent cornerpiece.

10 The shelf can be inserted between the runners of an item of furniture via studs or stubs 18, 19 borne respectively by the cornerpieces 4 and 5 and via projections 20, 21 borne respectively by the cornerpieces 6 and 7. In Figure 3a, a removed part of
15 the cornerpiece 7 allows a glimpse of the internal reinforcing walls 24 of the cornerpieces, particularly for reinforcing the projections 20, 21. The cornerpieces 4 and 5 are also respectively fitted with backrests 22, 23, the backrest 23 which, unlike the
20 rest of the piece, cannot be fitted together, being cut to an appropriate length in order to be able to meet up with the backrest 22 when the two cornerpieces 4 and 5 are fitted together at their definitive length. This backrest makes it possible to prevent foodstuffs from
25 dropping into the air circulation space provided at the rear of the shelf when the shelf is used in a refrigerator or to prevent the foodstuffs from touching the back wall of the refrigerated chamber.

The embodiment illustrated in Figures 4a and 4b
30 is identical to the embodiment illustrated in Figure 3, except that the parts 18, 19, 20, 21 used to assemble the shelf in an item of furniture have been omitted, assembly being achieved using other elements 25, 27, and except that the backrest 23 can fit into the
35 backrest 22, that is to say that the cornerpieces 4 and 5 can fit together over their entire height. As regards the assembling of the shelf into the chassis of an item of furniture, the cornerpieces 4 and 7 (and symmetrically, the cornerpieces 5 and 6) each comprise,

on the underside of one of their legs, a fin or "flange" 25, 26, the fin of the cornerpiece 4 (and symmetrically, of the cornerpiece 5) comprising, at one of its ends, an attachment means 27 allowing the shelf
5 to be attached by one of its side to a chassis; in this case, each fin may comprise a metallic part (not visible) embedded in the plastic to stiffen the rack and give it better stability. The fins of the cornerpieces 4 and 7 (and symmetrically, of the pieces
10 5 and 6) can be fitted together or may have been cut to appropriate lengths to allow them to meet when the pieces are fitted together.

In some embodiments which are far less advantageous, it would also be possible to envisage
15 producing the shelves illustrated in Figures 1d, 1e, 2c, 3a, 3b, 4a and 4b using cornerpieces devoid of the male ends (for example, devoid of the ends 4a, 5a, 6a, 7a in the embodiment illustrated in Figure 1), the parts corresponding to these ends being replaced by
20 straight cover pieces which join the cornerpieces together and can fit together with and slide in the cornerpieces. It would also be possible to envisage omitting the said male ends of the cornerpieces, leaving the glass bare at certain points.

25 Other alternative forms may also be envisaged for tailoring the shelf (in terms of aesthetics and/or functional characteristics) to the items of furniture in which it is to be mounted.

The shelf according to the invention is
30 particularly suited to supporting items in refrigerated installations (as refrigerator shelves intended to support food for example) but can also be used to advantage in other, non-refrigerated, items of furniture. It has advantages in terms of simplicity and
35 cost of manufacture, simplicity of use, health and safety, and in terms of aesthetic appearance. The shelf according to the invention can be used to advantage in refrigerators or chiller cabinets or any other similar structure, refrigerated or otherwise.